

Having thus defined the invention, the following is claimed:

1. An output choke for a D.C. arc welder comprising a high permeability core with an inductance controlling air gap defined by first and second pole pieces terminating in first and second surfaces facing each other and each having two spaced edges with an intermediate area, said surfaces converging from said intermediate area toward each of said edges to generate a specific cross sectional shape for said gap.

2. An output choke as defined in claim 1 wherein said cross-sectional shape is symmetrical.

3. An output choke as defined in claim 1 wherein said cross-sectional shape is a diamond.

4. An output choke as defined in claim 1 wherein said cross-sectional shape is oval.

5. An output choke as defined in claim 1 wherein said cross-sectional shape is curvilinear.

6. An output choke as defined in claim 1 wherein said intermediate area is closer to one of said edges.

7. An output choke as defined in claim 6 wherein said cross-sectional shape is a

diamond.

8. An output choke as defined in claim 1 wherein said edges of said first surface touch the edges of said second surface.

9. An output choke as defined in claim 8 wherein said cross-sectional shape is a diamond.

10. An output choke as defined in claim 9 wherein said cross-sectional shape is oval.

11. An output choke as defined in claim 8 wherein said cross-sectional shape is curvilinear.

12. An output choke as defined in claim 8 wherein said intermediate area is closer to one of said edges.

13. An output choke as defined in claim 1 wherein said gap is filled with a low permeability material.

14. An output choke as defined in claim 1 wherein said choke includes a winding for conducting welding current wherein said winding and core are sized to prevent saturation at a weld current of at least about 100 amperes.

5 15. A method of controlling the inductance in the output circuit of a D.C. electric arc welder operated over a given current range to weld by passing a weld current in the gap between an electrode and a workpiece, said method comprising: providing an inductor with a generally constant inductance over said current range for charging a capacitor connected in parallel with said gap; providing a choke with an inductance gradually varying over said current range; and, connecting said choke in series with said gap and between said gap and said capacitor.

16. The method as defined in claim 15 wherein said inductance varies in a generally straight line inversely proportional to said weld current.

17. The method as defined in claim 15 wherein said choke includes a winding and including the step of directing a weld current of at least about 50 amperes through said winding and across said gap.

18. An output choke for a D.C. arc welder comprising a high permeability core with an area having a cross sectional shape with two spaced edges and an air gap in said area, said air gap having a gradually varying width for at least a portion of the distance between said edges.

19. An output choke as defined in claim 18 wherein said air gap has a generally diamond shaped cross-section between said spaced edges.

20. An output choke as defined in claim 19 wherein said choke includes a winding for conducting welding current wherein said winding and core are sized to prevent saturation at a weld current of at least about 100 amperes.

21. An output choke as defined in claim 20 wherein said choke includes a winding for conducting welding current wherein said winding and core are sized to prevent saturation at a weld current of at least about 100 amperes.